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Coding Boot Camp



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Session : Core 07

Introduction to Subroutines
(Procedures and Functions)



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- IT teacher at Ellisras High School in Lephalale, Limpopo, South Africa
- HOD
Information Technology
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and Economics Department
- Live in Lephalale (Ellisras).
- Passionate about teaching my students.
- Hobby: Roses



Sub routines Session outline

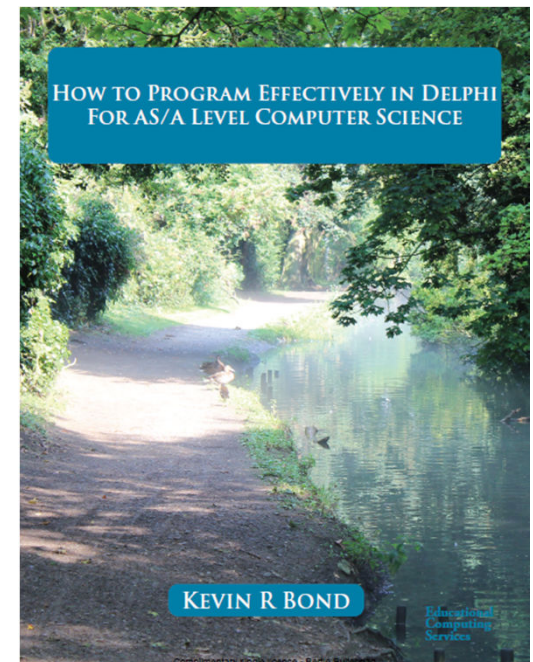


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Textbook reference

Chapter 13




- Definition of subroutines
- Advantages of using subroutines
- Subroutine Libraries
- Functions
- Procedures





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Resources: Core 07

-  FunctionsAndProceduresData
-  FunctionsAndProceduresSolution
-  CodingBootCamp_2022_LearnDelphi_Session Core7.pptx



Sub-routines

A subroutine is a named self-contained block of instructions, e.g. drawsquare. By encapsulating and naming a block of instructions in a program it becomes possible to call the block from other parts of the program.

This is very useful in situations where the same block of instructions or action or calculation needs to be repeated in multiple places in a program.

*Definition from the book of Dr Kevin R Bond,
How to Program Effectively in Delphi For AS/A Level Computer Science, page 212
We will be using references from this book during this presentation*

Advantages of using sub-routines in programs (1)

- Without subroutines all programming code would consist of inline blocks of programming instructions.
- This would make even programs of modest size
 - difficult to understand
 - difficult to program
- Removing blocks of instructions from the program block and placing these in 'out of line', named subroutine blocks reduces the intellectual demand needed to understand what the program does.

*Dr Kevin R Bond,
How to Program Effectively in Delphi For AS/A Level Computer Science, page 214
We will be using references from this book during this presentation*

Advantages of using sub-routines in programs (2)

- Subroutines can be worked on separately which is useful when writing and debugging software.
- Different subroutines can be given to different member of of a team to write and debug.
- Subroutines written for one program can be reused in different programs.
- If a subroutine is particularly useful it can be added to a library of subroutines which can be imported into any program which needs them.

*Dr Kevin R Bond,
How to Program Effectively in Delphi For AS/A Level Computer Science, page 214
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A full-page background image showing an astronaut in a white spacesuit sitting on a black equipment case on the lunar surface. The astronaut is holding a small device in their gloved hand. In the background, the curved horizon of the Earth is visible against the blackness of space, with a bright blue and orange glow from the sun or moon. The lunar surface is grey and rocky.

Delphi includes libraries of pre-written functions and procedures that we use every day.

Functions:

- IntToStr
- Copy
- Pos
- Length
- Randbetween

Procedures:

- Showmessage
- Delete
- Insert
- Inc
- Randomize

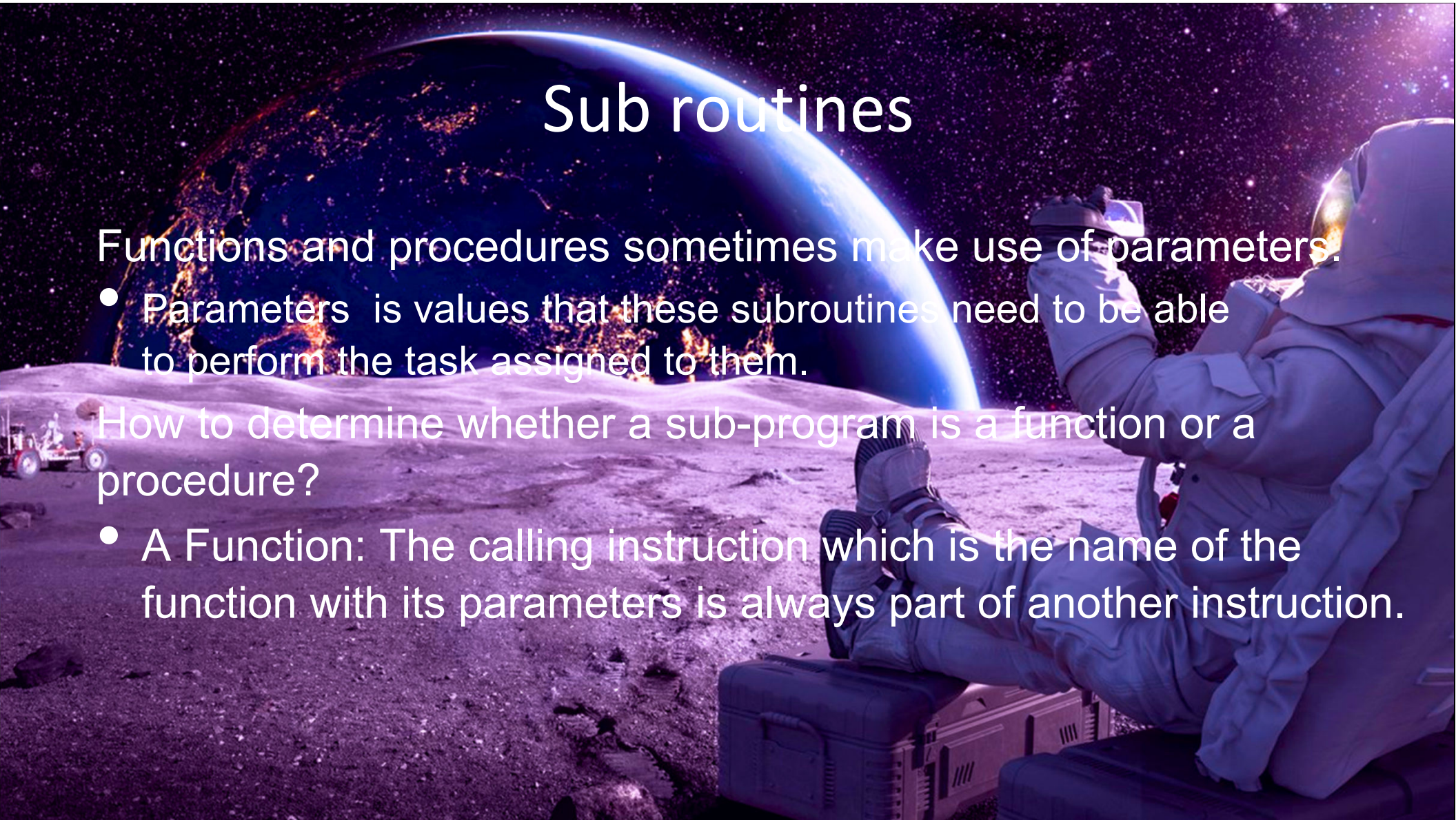
Sub routines

Functions and procedures sometimes make use of parameters.

- Parameters is values that these subroutines need to be able to perform the task assigned to them.

How to determine whether a sub-program is a function or a procedure?

- A Function: The calling instruction which is the name of the function with its parameters is always part of another instruction.



Functions – Sub routine returning a single answer

Var

sLine, sCourse : string;

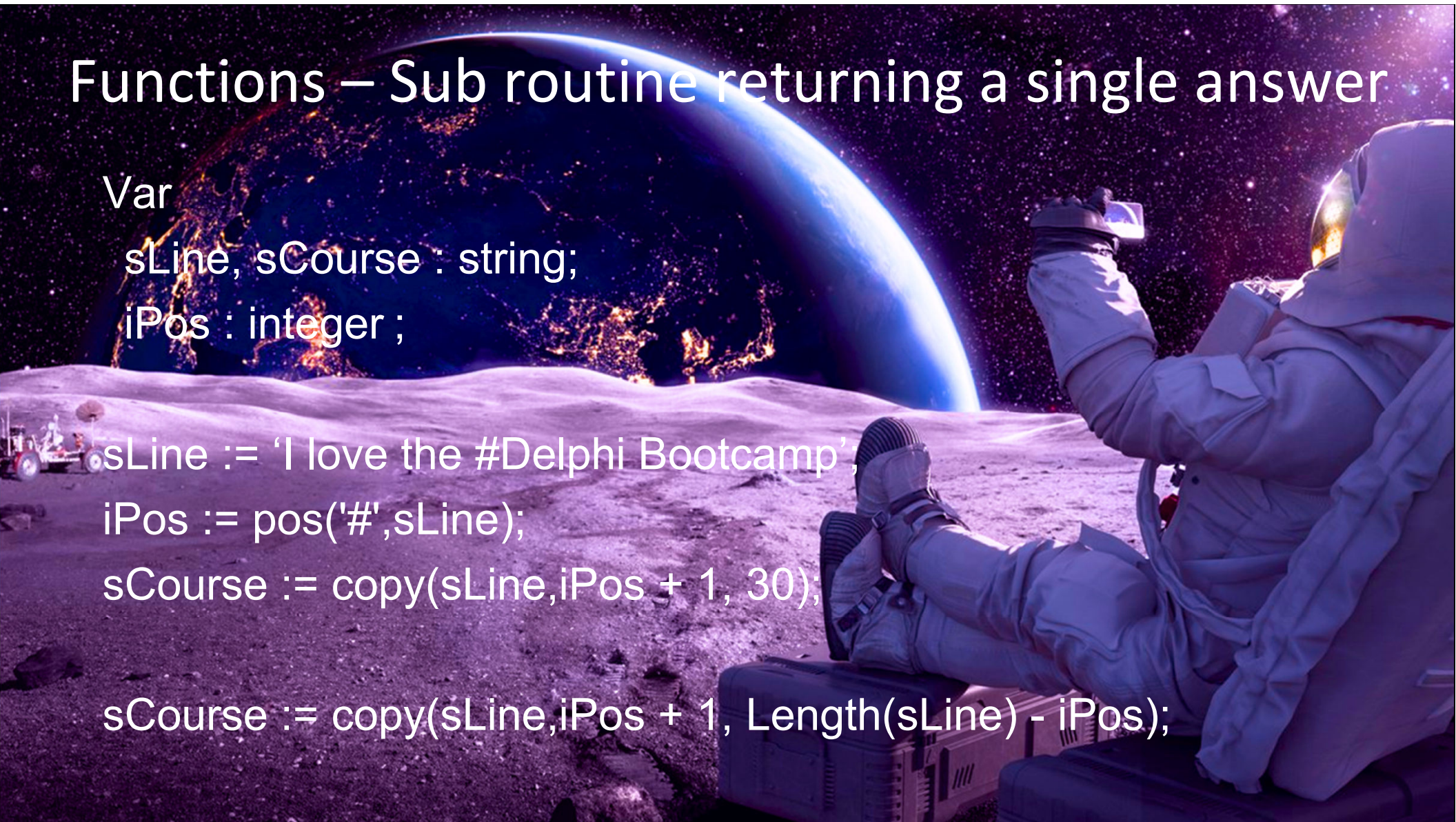
iPos : integer;

sLine := 'I love the #Delphi Bootcamp';

iPos := pos('#',sLine);

sCourse := copy(sLine,iPos + 1, 30);

sCourse := copy(sLine,iPos + 1, Length(sLine) - iPos);



A full-page background image showing an astronaut in a white spacesuit sitting on a grey metal crate on the lunar surface. The astronaut is holding a small device in their right hand. In the background, the Earth is visible as a large, glowing blue and orange sphere against the black, star-filled sky. The lunar surface is covered in grey dust and small rocks. A small lunar rover is visible in the distance on the left.

Delphi includes libraries of pre-written functions and procedures that we use every day.

- A Procedure: The calling instruction which is the name of the procedure with its parameters is an instruction on its own.

Procedure

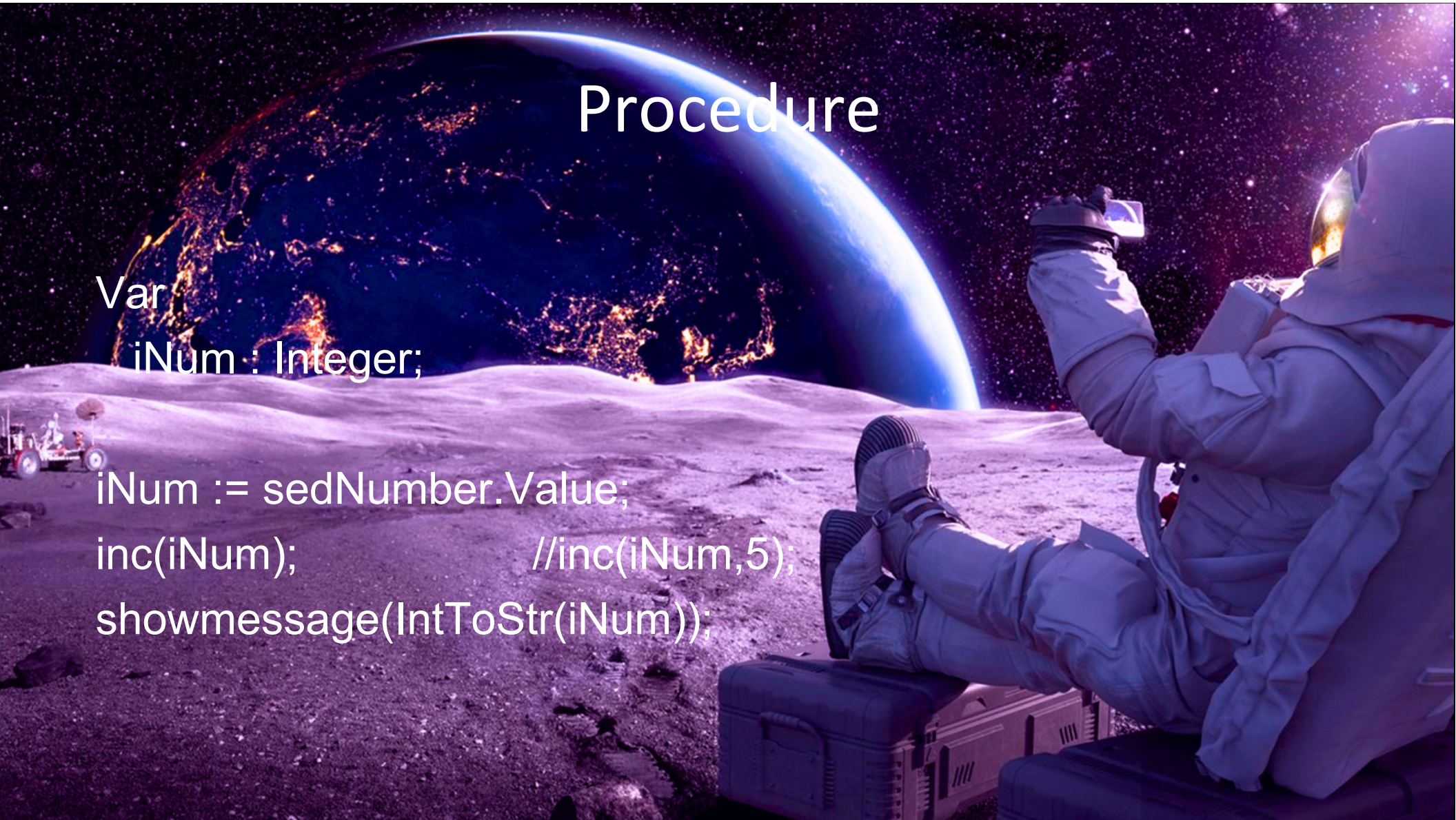
Var

iNum : Integer;

iNum := sedNumber.Value;

inc(iNum); //inc(iNum,5);

showmessage(IntToStr(iNum));



A full-page background image showing an astronaut in a white spacesuit sitting on a metal crate on the Moon's surface. The astronaut is holding a small device up to their face. In the background, the Earth is visible as a large, glowing blue and orange sphere against a starry space. A small lunar rover is parked on the left side of the frame.

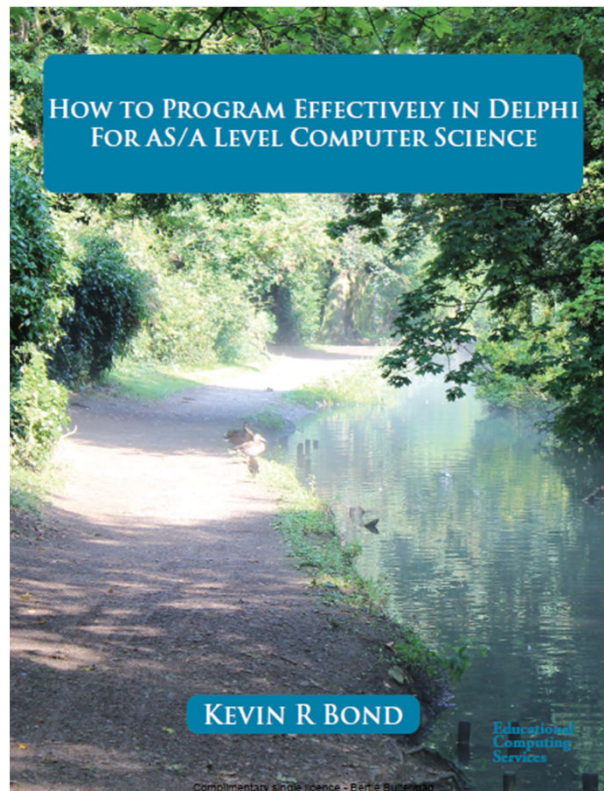
Lets move over to Delphi....



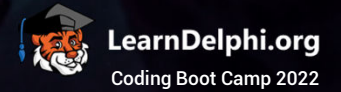
Resources



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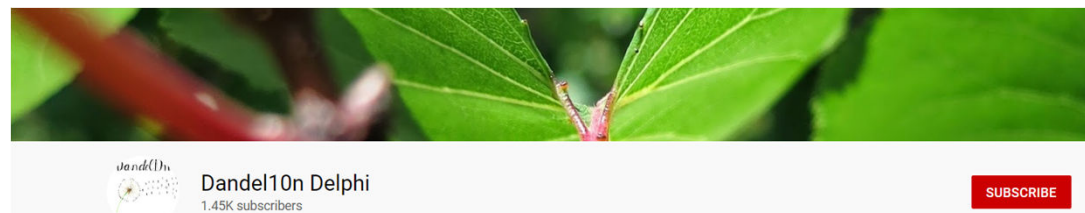
Resources



<https://www.youtube.com/c/DelphiSchoolsDelphiProgrammingTutorials>



<https://www.youtube.com/channel/UCPQG0dcSGvOP20NLcjnYTPQ>



<https://www.youtube.com/channel/UCITMwGlsiKgY5Z-F5ZaCH4w/videos>



Resources



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Label1.Caption := 'Thank you 😊';